

WHAT IS CLAIMED IS:

- 1           1.     A router comprising:  
2           a housing supporting a motor for driving an output shaft to which a bit holding  
3 mechanism can be attached, said housing being vertically movable a predetermined  
4 maximum distance relative to a base structure;  
5           a base structure having a pair of spaced vertical guide posts along which said  
6 housing can be vertically moved;  
7           a flexible baffle configured to vertically expand and contract as the housing is  
8 vertically moved relative to said base structure surrounding at least one of said guide  
9 posts, said baffle being larger than said guide post to thereby define a space  
10 therebetween; and  
11          a coil spring located in said space to bias said housing away from said base  
12 structure, said spring having an hourglass configuration and being capable of being  
13 compressed to permit said housing to move said predetermined maximum distance  
14 relative to said base structure.
- 15          2.     A router as defined in claim 1 wherein said coil spring has a plurality of  
16 coils, a first end portion of coils having a first outer diameter, a second end portion of  
17 coils having a second outer diameter and a third center portion having a third diameter.
- 18          3.     A plunge router as defined in claim 2 wherein said first and second  
19 diameters are greater than said third diameter.
- 20          4.     A router as defined in claim 3 wherein said first and second diameters are  
21 generally the same size.
- 22          5.     A router as defined in claim 3 further including a transition portion between  
23 said third portion and each of said first and second portions.
- 24          6.     A router as defined in claim 5 wherein said third portion is capable of  
25 telescoping into said first and second portions to reduce the solid height of said coil  
26 spring compared to a spring having a uniform diameter of the same size as said first and  
27 third portions.

1           7.     A router as defined in claim 6 wherein said spring has a free height of  
2 approximately 7.125 inches, is made of 0.065 inches diameter high carbon spring steel  
3 music wire having approximately 15.25 coils, with said first and second portions  
4 comprising approximately 4 coils, said third portion comprising approximately 2 coils  
5 and each of said transition portions comprising approximately 3 coils, said first and  
6 second portions having coils with an outer diameter of approximately 3/4 inch and said  
7 third portion having coils with an inside diameter of approximately 0.56 inches, said  
8 approximately 15.25 coils having a solid height of approximately 10 coils as a result of  
9 said coils of said third and transition portions telescoping into said first and second end  
10 portions.

11           8.     A router as defined in claim 1 further including a second flexible baffle  
12 configured to vertically expand and contract as the housing is vertically moved relative to  
13 said base structure surrounding said other guide post, said baffle being larger than said  
14 other guide post to thereby define a space therebetween; and

15           a second coil spring located in said space to bias said housing away from said base  
16 structure, said spring having a uniform outer diameter and being capable of being  
17 compressed to permit said housing to move said predetermined maximum distance  
18 relative to said base structure.

19           9.     A router as defined in claim 8 wherein said second coil spring has a free  
20 height of approximately 9 inches, approximately 21.5 coils, an outsider diameter of  
21 approximately 0.84 inches and is made of approximately 0.029 diameter high carbon  
22 spring steel music wire.

23           10.    A plunge router comprising:

24           a housing supporting a motor for driving an output shaft to which a bit holding  
25 mechanism can be attached, said housing being vertically movable a predetermined  
26 maximum distance relative to a base structure;

27           a base structure having a pair of spaced vertical guide posts along which said  
28 housing can be vertically moved;

1 a flexible baffle configured to vertically expand and contract as the housing is  
2 vertically moved relative to said base structure surrounding each of said guide posts, said  
3 baffles being larger than said guide post to thereby define a space therebetween; and

4 first and second coil springs located in said space to bias said housing away from  
5 said base structure, said first spring having an hourglass configuration and being capable  
6 of being compressed to permit said housing to move said predetermined maximum  
7 distance relative to said base structure, said hourglass configuration preventing sufficient  
8 deformation of said spring that buckling of said spring can result, which can produce a  
9 loss of spring force and deformation of said associated baffle.

10 11. A plunge router as defined in claim 10 wherein said second spring has a  
11 generally uniform outer diameter throughout its length, the spring force of said first  
12 spring being greater than the spring force of said second spring.

13 12. A plunge router as defined in claim 11 wherein the diameter of the material  
14 of which said first spring is made is greater than the diameter of the material of which  
15 said second spring is made.

16 13. A plunge router as defined in claim 11 wherein said first spring has a  
17 plurality of coils including opposite end portions of coils having a larger outer diameter  
18 with the end portions transitioning to a center portion of coils having a smaller coil  
19 diameter.

20 14. A plunge router as defined in claim 13 wherein said center portion coils are  
21 capable of collapsing into said opposite end portions to reduce the solid height of said  
22 coil spring compared to a spring having a uniform diameter of the same size as said  
23 opposite end portions.